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United States Department of Agriculture,  
**FOREST SERVICE.**

GIFFORD PINCHOT, Forester.

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**SILVICAL LEAFLET 21.**

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**JEFFREY PINE.**

*Pinus jeffreyi* Oreg. Com.

The Jeffrey pine bears a very close resemblance to the western yellow pine, and some authorities regard it simply as a variety. The chief distinguishing characteristic lies in the cones, which are generally more than 6 inches long. It is an important timber tree. It is cut with western yellow pine, and the wood is not distinguished in quality and value from that of the latter. The Jeffrey pine also plays an important part in the protection of forests on the high elevations in the Sierras and in the semiarid coast mountains of southern California. Although it is a small tree in such situations, the wood is used locally for mine timbers.

**RANGE AND OCCURRENCE.**

The Jeffrey pine ranges from the mountains of southern Oregon, through the Sierras and coast ranges of California to Mount San Pedro Martir in Lower California. Throughout its range it occurs chiefly between the optimum altitudes of western yellow pine and of white fir. The altitudinal limits are higher on the western sides of the mountain ranges. In southern Oregon and northern California it extends from 3,500 to 6,000 feet above sea level; in the central Sierras from 5,000 to 8,500 feet, where most of the commercial timber, however, grows below 6,500 feet; and in Lower California from 4,000 feet on the western slopes near the sea to 10,000 feet. It reaches its best development in the San Bernardino Mountains.

Jeffrey pine generally extends to higher, cooler, and drier situations than yellow pine. In the northern part of its range it mingles with yellow pine at the upper limit of that species, but is more abundant above it on the drier ridges and steep southern slopes in the fir type of forest. In southern California it occupies the higher, drier situations, and extends farther toward the desert side of the mountains than yellow pine.

## CLIMATE.

The mean annual rainfall through the greater part of its range varies from 20 to more than 60 inches, with an average of about 35 inches in the region of its best development. It endures wide annual ranges of temperature, but the minimum and maximum in the regions of its best growth probably lie in the neighborhoods of zero and 100° F. The air moisture requirements of Jeffrey pine are less than those of white fir and sugar pine, and greater than those of Coulter pine, incense cedar, and yellow pine.

## HABIT.

Jeffrey pine differs from the typical western yellow pine in its lighter colored foliage, longer needles, and usually darker, rougher bark. These differences are hard to be sure of, however, and the most important distinguishing feature is found in the large, heavy cones, which are generally from 5 to 15 inches long.

In favorable situations Jeffrey pine attains large size, with a height of 180 feet and a diameter of from 3 to 5 feet. It is more abundant in poorer situations, however, where it seldom averages more than from 75 to 100 feet in height, and from 1 to 2½ feet in diameter. It usually forms a long, moderately tapering bole, free of branches for from 30 to 60 feet. The flattened oval crown is made up of heavy limbs, usually clothed with dense foliage.

The root system varies greatly with the situation. Young trees have long tap roots and deep root systems, in order to withstand the dry summers. In later life the roots are usually wide spreading and often only moderately deep.

## SOIL AND MOISTURE.

Jeffrey pine can grow with very little soil moisture and is not exacting in regard to soil quality. It will grow on poor, shallow soils too dry for yellow pine. It does best, however, on a loose sandy or gravelly loam with abundant moisture.

## ASSOCIATED SPECIES.

In the humid regions of the northern part of its range Jeffrey pine occurs scattered through the forests at the lower elevations in mixture with yellow pine, sugar pine, incense cedar, white fir, and sometimes Douglas fir. At higher elevations it associates with white fir, red fir, lodgepole pine, and black hemlock, and sometimes forms pure stands on rocky ridges and southern slopes.

In the semiarid forests of the southern California coast ranges Jeffrey pine is more abundant, and is found frequently in pure stands, or in mixture with yellow pine. At its lower altitudinal limits in these mountains it mingles with Coulter pine, bigcone spruce, and black oak, and on moister northern slopes with sugar pine and incense cedar,

while in the higher parts of its range white fir, white-bark and limber pines, and lodgepole pine grow in mixture with it. On drier slopes single-leaf piñon and western juniper mingle with Jeffrey pine in open, scattered stands.

#### TOLERANCE.

The Jeffrey pine is fairly tolerant in youth, and will persist under chaparral on eastern and southern exposures. It is not so tolerant in this regard as Coulter pine, however. In later life it is about equal in tolerance to yellow pine, less tolerant than white fir, red fir, incense cedar, and sugar pine, but more so than lodgepole pine.

#### GROWTH AND LONGEVITY.

Jeffrey pine is fairly rapid in growth even on poor sites. It matures in from 150 to 250 years, but is sound and thrifty up to 300 or 350 years.

#### REPRODUCTION.

Although Jeffrey pine is a prolific seed producer, its seed years are irregular in occurrence. Trees commence to bear cones rather late in life, and decrease in productiveness in old age. The species reproduces vigorously at higher altitudes than does yellow pine. Exposed mineral soil and open sunlight favor reproduction. The seeds have a high germination percentage and great vitality. Reproduction is excellent except in very dry situations.



